

Remarks/Arguments

Claim Summary

By this Amendment, claim 1 has been revised to incorporate the subject matter of dependent claim 4, and claims 4 and 6-8 have been cancelled.

Claims 1-2, 5 and 9-22 are now pending in the application.

35 U.S.C. ¶103

Claims 1, 2, 4, 6, 7, 9, 13 and 15-20 were rejected under 35 U.S.C. ¶103 as being unpatentable over Dornfest et al. (US 5680013) in view of Nguyen (US 6565661). Claims 10-12 were rejected under 35 U.S.C. ¶103 as being unpatentable over Dornfest et al. in view of Nguyen, and further in view of Arami et al. (US 5938850). Claims 1, 2, 4-9 and 12-21 were rejected under 35 U.S.C. ¶103 as being unpatentable over Doppelhammer et al. (US 6533867) in view of Nguyen (US 6565661). Claims 10-11 were rejected under 35 U.S.C. ¶103 as being unpatentable over Doppelhammer et al. in view of Nguyen, and further in view of Arami et al. (US 5938850). Applicants traverse these rejections with respect to the now-pending claims.

As noted above, by this Amendment, independent claim 1 has been revised to incorporate the subject matter of dependent claim 4 (now cancelled). Thus, claim 1 now recites that sheet is fitted between the reservoir and the faceplate.

Dornfest and Nguyen.

The skilled person would be presented with two problems when looking at the Nguyen citation. First, if the skilled person was to produce two separate "sheets" in order to produce "separable" version of the apparatus described by Nguyen, then he would encounter the problem of lining the apertures, which can be difficult when they are small in dimension as is the case for showerheads. Second, the front of the plate would get eroded by exposure to plasma within the processing chamber.

Dornfest's solution to the latter problem is to add a ceramic cover that has openings of the same dimension and position as the aluminum front plate 115 of the showerhead. Accordingly, if the skilled person combined Nguyen and Dornfest without exercising any inventive skill then he would simply get a front plate that has the same locations and dimensioned holes as the smaller diameter hole 18 shown in Nguyen's patent. This could overcome the second problem mentioned above, but not the first.

Doppelhammer and Nguyen.

The intention of Doppelhammer seems to be to create sets of aligned diffusion chambers over the face of the showerhead so that gas introduced into the upper well of the chambers can diffuse into the lower chamber to mix with the gas that has been introduced there before the carrier gas and the precursor are carried out into the reaction chamber. Screens are provided between the two chambers in order to slow the flow and to allow the mixing to take place. Thus, if the skilled person were to combine those two documents without exercising any inventive skill then the result would be to place the back plate 14 of Nguyen outside the disc 43 of Doppelhammer. This is because the teaching of Nguyen is that the back plate is there to control deliverance of the gas after diffusion/mixing has taken place (see for example, column, lines 46 to 50 of Nguyen). The skilled person would therefore effectively simply add the showerhead plate 14 of Nguyen to the bottom of disc 43 in Doppelhammer's apparatus, rather than insert a sheet with smaller diameters between the reservoir and the faceplate. There is no suggestion of inserting such a sheet inside the showerhead (i.e. above/in front of the outlet apertures of the showerhead itself) in either document.

Having the sheet located between the reservoir and the faceplate means that it defines the conductance through each pair of aligned holes and, as suggested at the end of the present description, can be used to block off certain

flow paths. This latter feature means that it is particularly suitable for a duplex arrangement and this is not in any sense whatsoever postulated by Nguyen, taken alone or in combination with the remaining art of record.

For at least the reasons stated above, and the reasons already of record (and incorporated herein), Applicants submit it to be manifest that the now pending claims define over the art of record.

Conclusion

No other issues remaining, reconsideration and favourable action upon the claims 1-2, 5 and 9-22 now pending in the application are requested.

Respectfully submitted,
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June 20, 2007

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